Impact of long-term forest enrichment planting on the biological status of soil in a deforested Dipterocarp Forest in Perak, Malaysia.

ABSTRACT

Deforestation leads to the deterioration of soil fertility which occurs rapidly under tropical climates. Forest rehabilitation is one of the approaches to restore soil fertility and increase the productivity of degraded areas. The objective of this study was to evaluate and compare soil biological properties under enrichment planting and secondary forests at Tapah Hill Forest Reserve, Perak after 42 years of planting. Both areas were excessively logged in the 1950s and left idle without any appropriate forest management until 1968 when rehabilitation program was initiated. Six subplots (20m 20m) were established within each enrichment planting (F1) and secondary forest (F2) plots, after which soil was sampled at depths of 0-15cm (topsoil) and 15-30cm (subsoil). Results showed that total mean microbial enzymatic activity, as well as biomass C and N content, was significantly higher in F1 compared to F2. The results, despite sample variability, suggest that the rehabilitation program improves the soil biological activities where high rate of soil organic matter, organic C, N, suitable soil acidity range, and abundance of forest litter is believed to be the predisposing factor promoting higher population of microbial in F1 as compared to F2. In conclusion total microbial enzymatic activity, biomass C and biomass N evaluation were higher in enrichment planting plot compared to secondary forest. After 42 years of planting, rehabilitation or enrichment planting helps to restore the productivity of planted forest in terms of biological parameters.

Keyword: Forest rehabilitiation; Soil fertility.